

Appln. No. 09/626,090  
Amdt. dated December 8, 2004  
Reply to Office Action dated October 19, 2004

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently amended) A method for modifying at least one electrical characteristic of a horn antenna, comprising the steps of:  
    configuring said horn antenna in a first operating mode in which said horn antenna has at least a first electrical characteristic; and  
    selectively changing at least one of a volume and a location of a conductive fluid contained in at least one cavity having a fixed position within said horn antenna to produce at least a second operating mode in which said horn antenna has at least a second electrical characteristic different from said first electrical characteristic.
2. (Original) The method according to claim 1 wherein said selectively changing step further comprises selectively varying a profile of at least one conductive inner surface of said horn antenna.
3. (Original) The method according to claim 1 wherein said selectively changing step further comprises selectively varying a position of at least one conductive surface of said horn antenna.
4. (Currently amended) A method for modifying at least one electrical characteristic of a horn antenna, comprising the steps of:  
    configuring said horn antenna in a first operating mode in which said horn antenna has at least a first electrical characteristic; and  
    selectively changing at least one of a volume and a location of a conductive fluid contained within said horn antenna to produce at least a second operating mode in which said horn antenna has at least a second electrical characteristic different from said first electrical characteristic; and

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~~The method according to claim 1~~ wherein said selectively changing step further comprises changing a flare angle of said horn antenna.

5. (Original) The method according to claim 1 wherein said selectively changing step further comprises changing at least one internal dimension of a throat region of said horn antenna.

6. (Currently amended) A method for modifying at least one electrical characteristic of a horn antenna, comprising the steps of:

configuring said horn antenna in a first operating mode in which said horn antenna has at least a first electrical characteristic; and

selectively changing at least one of a volume and a location of a conductive fluid contained within said horn antenna to produce at least a second operating mode in which said horn antenna has at least a second electrical characteristic different from said first electrical characteristic; and

~~The method according to claim 1~~ wherein said selectively changing step further comprises changing at least a corrugation geometry of said horn antenna.

7. (Original) The method according to claim 1 wherein said selectively changing step further comprises changing at least an aperture diameter of said horn antenna.

8. (Original) The method according to claim 1 wherein said electrical characteristic is selected from the group consisting of an input impedance, a radiation pattern, a gain, and an antenna beamwidth.

9. (Original) The method according to claim 1 wherein said selectively changing step further comprises controlling at least one of a valve, a pump and a fluid actuator.

10. (Currently amended) An electromagnetic horn antenna comprising:  
a horn housing having a throat portion, a tapered portion and an aperture;  
at least one cavity structure defined at a fixed position within said horn housing,  
said cavity structure comprising at least one portion formed of a dielectric material;

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a conductive fluid and a fluid control system, said fluid control system selectively controlling at least one of a volume and a position of said conductive fluid contained within said at least one cavity structure for dynamically modifying at least one electrical characteristic of said electromagnetic horn antenna.

11. (Original) The electromagnetic horn antenna according to claim 10 wherein an interior surface of said housing is corrugated so as to define a series of ribs axially spaced along a length of said horn housing and defining a plurality of slots.
12. (Original) The electromagnetic horn antenna according to claim 10 wherein said at least one cavity structure is at least partially comprised of said ribs.
13. (Original) The electromagnetic horn antenna according to claim 12 wherein at least one of said plurality of ribs is formed of a conductive material.
14. (Original) The electromagnetic horn antenna according to claim 12 wherein at least one of said plurality of ribs is formed of a dielectric material.
15. (Original) The electromagnetic horn antenna according to claim 10 wherein said at least one portion of said cavity structure is an annular dielectric wall extending between adjacent ones of said ribs.
16. (Original) The electromagnetic horn antenna according to claim 10 wherein said at least one electrical characteristic is selected from the group consisting of an input impedance, a radiation pattern, a gain, and an antenna beamwidth.
17. (Currently amended) An electromagnetic horn antenna comprising:  
a horn housing having a throat portion, a tapered portion and an aperture;  
at least one cavity structure defined within said horn housing, said cavity  
structure comprising at least one portion formed of a dielectric material;  
a conductive fluid and a fluid control system, said fluid control system selectively  
controlling at least one of a volume and a position of said conductive fluid contained

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within said at least one cavity structure for dynamically modifying at least one electrical characteristic of said electromagnetic horn antenna; and

~~The electromagnetic horn antenna according to claim 10~~ wherein said control system controls said volume of said conductive fluid to change a flare angle of said horn antenna.

18. (Original) The electromagnetic horn antenna according to claim 10 wherein said control system controls said conductive fluid to change at least one internal dimension of said horn antenna.

19. (Currently amended) An electromagnetic horn antenna comprising:  
a horn housing having a throat portion, a tapered portion and an aperture;  
at least one cavity structure defined within said horn housing, said cavity structure comprising at least one portion formed of a dielectric material;  
a conductive fluid and a fluid control system, said fluid control system selectively controlling at least one of a volume and a position of said conductive fluid contained within said at least one cavity structure for dynamically modifying at least one electrical characteristic of said electromagnetic horn antenna; and

~~The electromagnetic horn antenna according to claim 10~~ wherein said control system controls said conductive fluid to change at least a corrugation geometry of said horn antenna.

20. (Original) The electromagnetic horn antenna according to claim 10 wherein said control system controls said conductive fluid to change at least an aperture diameter of said horn antenna.

21. (Currently amended) An electromagnetic horn antenna comprising:  
a horn housing having a throat portion, a tapered portion and an aperture;  
at least one cavity structure defined within said horn housing, said cavity structure comprising at least one portion formed of a dielectric material;  
a conductive fluid and a fluid control system, said fluid control system selectively controlling at least one of a volume and a position of said conductive fluid contained

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within said at least one cavity structure for dynamically modifying at least one electrical characteristic of said electromagnetic horn antenna; and

~~The electromagnetic horn antenna according to claim 10~~ wherein said control system controls said conductive fluid to convert an inner conductive surface of said horn antenna from a smooth profile to a corrugated profile.

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